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How Do Tourists React to Political Violence? An Empirical Analysis of Tourism in Egypt

David Fielding[§] and Anja Shortland[¶]

Abstract

This paper uses a detailed database of political violence in Egypt to study European and US tourists' attitudes towards travelling to a conflict region. We use time series analysis to study the heterogeneous impacts of different dimensions of political violence and counter-violence on tourist flows to Egypt in the 1990s. We find that both US and EU tourists respond negatively to attacks on tourists, but do not appear to be influenced by casualties arising in confrontations between domestic groups. However, European tourists are sensitive to the counter-violence measures implemented by the Egyptian government. There is also evidence of tourism in Egypt being affected by the Israeli / Palestinian conflict, with arrivals of tourists into Egypt rising when fatalities in Israel increase.

JEL Classification: P48, L83

Keywords: Tourism, Political Violence, Egypt

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1. Introduction

Egypt has seen several waves of Islamist violence against "soft" targets in the tourism sector. The first wave of attacks occurred in the 1990s culminating in the massacre at the temple of Hatshepsout near Luxor in 1998. More recent examples are the co-ordinated attacks on the Taba Hilton and Ras Satan in October 2004, on Sharm el-Sheik in July 2005 and the Khan-el-Khalili in Cairo in February 2009. Tourism is a major industry in Egypt, worth about 12.6bn US$ in 2009.[1] According to Tohamy and Swinscoe (2000), it accounted for 11.6% of GDP if one includes the secondary effects of tourist spending.

Even though the number of tourist victims in terrorist incidents tends to be relatively small and political violence represents only a negligible risk to an individual tourist, research shows that their effects on tourist numbers and tourism revenues can be severe, and violence in one destination induces a substitution effect between countries. The main themes explored in the empirical literature are (a) the extent and time profile of the substitution effect between countries suffering from political violence and safer choices;[2] (b) generalisation effects, where terrorism in one country cause a whole region to be perceived as risky;[3] (c) differences in attitudes to risks between countries.[4]

However, attacks on tourists are generally only a small part of a wider picture of political violence and instability.[5] Neumayer (2004) points out that the literature on violence and tourism has mostly focused on the issue of terrorism, rather than looking at political instability more generally. People may be put off travelling to a destination where there is a high level of political or inter-community tension even if it does not pose a direct threat to tourists and / or where ethical concerns are raised regarding the government's treatment of the political opposition.[6] Neumayer demonstrates in his

[1] http://www.euromonitor.com/factfile.aspx?country=EG.

[2] E.g. Enders, *et al* (1991); Enders *et al* (1992); Drakos and Kutan (2003); Neumayer (2004), Fielding and Shortland (2009)

[3] E.g. Enders *et al* (1992); Drakos and Kutan (2003).

[4] E.g. Tremblay (1989); Fielding and Shortland (2008).

[5] Targeting foreign nationals may be used by insurgent or opposition groups to generate national and international publicity in countries where the government tightly controls the local media. Disrupting the tourist industry also directly harms government revenues and foreign exchange receipts. Attacking foreigners may also have ideological objectives where tourists are targeted as the indirect representatives of different ideological values and political cultures (Aziz, 1996).

[6] See for example: http://www.amnesty.org/en/region/egypt.

2004 panel study that in both authoritarian countries and in countries in which human rights violations are common, tourist flows are reduced.

This paper takes Neumayer's innovation back to the country case study level and analyses the effects of several dimensions of political conflict on tourism in Egypt in the 1990s, where we have access to a highly detailed measure of political violence and counter-violence. The dataset records civilian, tourist and security force casualties as well as arrests of Islamists reported in the Egypt's *Al Ahram* newspaper.[7] We analyse monthly data on tourism in Egypt where previously only annual data has been used.[8]

The paper firstly explores how tourists respond to various aspects of (Islamist) political violence directed against civilians. Secondly we explore the effects of counter-violence on tourist flows. The Egyptian government suppressed the opposition Islamist movements, rather than seeking political accommodation. The main approach has been to arrest and detain people suspected of political activism; but heavy-handed policing also resulted in civilian casualties in riots and demonstrations and gun-battles with armed extremists. Tourists are highly unlikely to become caught up in these security force activities, but may be put off by heavy security measures around tourist attractions or shun holidays in a location with a negative human rights image.

Thirdly, we consider regional spill-over from the conflict in Israel/Palestine. On the one hand there is a high degree of substitutability between Red Sea resorts on the Egyptian and Israeli side of the border. On the other hand conflict in Israel may be expected to raise tension within Egypt[9] and has been directly linked to attacks on tourists on Egyptian soil. In all estimations we disaggregate between European and US tourists, who may have different attitudes to violence[10] and value Egyptian holidays for different reasons. These differences may make alternative destinations more or less easily substitutable.[11]

Our results show that potential tourists substitute away from Egypt in response to violent attacks on tourists, but not to local tensions, and that the response of

[7] See Fielding and Shortland (2010).
[8] Aly and Strazicich (2000); Sakr and Massoud (2003).
[9] Fielding and Shortland (2010).
[10] Fielding and Shortland (2008).
[11] Neumayer (2004).

European tourists is much more marked than that of tourists from the US. European tourists also respond negatively to the Egyptian government's crackdowns on the Islamist opposition, while no such effect is observed for US tourists. Although Egypt sees additional tourist flows when violence in the Israeli / Palestinian conflict increases, Egypt's government should be concerned about increasing tensions in Israel, because these sometimes result in violent attacks on Egyptian soil.

The remainder of the paper is organised as follows. The following section reviews the literature on the effect of political violence on tourism and sets out our hypotheses. Section 3 gives some background information on the political conflict in Egypt and gives details on our measures of political violence. Section 4 describes the model of tourist destination choice; section 5 describes the data, estimations and results. Section 6 discusses the results and concludes.

2. Literature Review and Research Hypotheses

There is now a growing literature on the economic effects of political violence on macroeconomic outcomes (much of which is reviewed in Frey *et al*., 2007). An important part of this literature investigates the effects of violent conflict on tourist destination choices. The typical modern tourist seeks relaxation and will switch between destinations in response to events that could potentially undermine the enjoyment of the holiday, even if the probability of being caught up in such an event is almost zero. The exact degree of substitution depends on whether a country's attractions are specific to the country and particularly valued by tourists (e.g. "sunny beaches" versus unique cultural and geographical features).[12] Most of the literature focuses on the response of tourists to terrorist attacks, where tourists may be killed accidentally or deliberately targeted. The literature demonstrates significant, but temporary reductions in tourist flows in response to terrorist attacks in both country case studies and regional studies. However, there seem to be differences between countries in the time profile of the reaction of tourist arrivals and revenues, depending on the structure of the tourism industry (e.g. package holidays versus individual bookings) and how far in advance tourists generally book their holiday.[13] Knowing

[12] Neumayer (2004).

[13] Enders and Sandler (1991), Enders *et al.* (1992), Fleischer and Buccola (2002), Pizam and Smith (2000); Pizam and Fleischer (2002).

the likely time profile of the response within a country is important information if the government decides to provide a subsidy to the tourism industry in response to terrorist attacks. While there are already two case studies confirming a temporary reduction in tourism to Egypt in response to violent events, both use annual data and focus on major violent events only.[14] There is also a question of the extent to which the severity of terrorist events matters for tourism. Pizam and Fleischer (2002) and Krakover (2001) show that tourism into Israel is negatively affected by the severity of terrorist attacks (in terms of the number of people killed and injured).[15] Sloboda (2003) and Ito and Lee (2005) focus on the effect of extraordinary events, showing large negative effects of the Gulf War of 1991 and the September 2001 attacks on US tourism flows. We use an index of the number of casualties as our measure of the severity of trans-national terrorist activity and in addition check whether the Luxor attack in November 1997 (which caused an unusually high number of casualties and was extensively covered in the international press) had a disproportionate effect on tourist flows.

H1: Tourists substitute (temporarily) away from Egyptian holidays in response to terrorist attacks in Egypt directly involving tourists. Large scale attacks may have disproportionate effects.

Neumayer (2004) looks at the effect of political instability and political violence more broadly in a dynamic cross country panel, arguing that tourists may also be put off by the repression of opposition movements, human rights abuses and police presence around tourist installations. He shows that tourists are affected in their destination choice not only by terrorist events, but also by violent political protest and repressive measures, such as restrictions of civil and political liberties, implemented by authoritarian governments. We re-examine this issue at the country level, where we are able to look at variations in political repression in much more detail than is

[14] Aly and Strazicich (2000); Sakr and Massoud (2003)

[15] Pizam and Fleischer (2002) also show that a count variable of the number of terrorist attacks in Israel in a month is econometrically preferred to the monthly casualty count variable. In Egypt the number of months with more than one event is very low and we have not adopted this strategy.

possible using annual cross-country panel data. In such data sets, there are few (if any) variations in Egypt's score for political and civil rights.[16]

H2: Tourists react negatively to an increase in political repression by the Egyptian government.

H3: Tourists react negatively to an increase in intercommunity tensions and Islamist violence against local civilians and the state.

The third issue we explore in this paper is the direction of spill-over effects from political violence in Israel / Palestine. Past studies have come to different conclusions about how violence in one country affects other countries in the same region. Some countries appear to have benefited from marketing themselves as "safe" alternative destinations within a region (Mansfeld 1996, Hall and Sullivan, 1996), but Drakos and Kutan (2003) demonstrate contagion (i.e. a negative externality) between Greece, Israel and Turkey. One would expect a positive effect if tourists substitute into holidays in Egypt when the threat of violence rises in Israel (the substitutability between Red Sea resorts being high). On the other hand, a negative effect could arise from generalisation effects.[17] In Egypt, this would be compounded by events in which Israelis (and hence other tourists) are targeted on Egyptian territory.[18] An increase in conflict intensity in Israel could therefore raise the expected level of violence in Egypt.[19]

H4: Tourists will substitute holidays in Egypt for holidays in Israel in response to political tensions in Israel, unless these tensions spill over into Egypt.

Finally, all of our estimates make use of disaggregated tourist flows, distinguishing between tourists from the United States and tourists from Europe. American and European tourists may have a different attitude to risk, violence and the visible presence of firearms on the street. The first reason is that people from a society

[16] This is discussed in more detail in section 3.
[17] Drakos and Kutan (2003).
[18] For example the hotel bombings on the Sinai Peninsula and the killing of eighteen Greek tourists in Cairo in April 1996 in the mistaken belief that they were Israeli tourists.
[19] This is shown in Fielding and Shortland (2010).

with more intercommunity tension, crime and lax gun laws may be more confident about being able to avoid dangerous situations.[20] Secondly, US tourists are likely to choose an Egyptian holiday primarily for its cultural attractions, which are less easily substituted than the "year-round sunshine" aspect which attracts many of the European visitors.[21]

H5: European tourists are more sensitive to violent events than American tourists.

3. Historical background and measures of violent political conflict

Egypt is a secular state in which Islamist movements have been excluded or marginalised from the political process. Islamist movements were banned under President Nasser, but a revival of Islamist groups started in the 1970s, their long-term goal being the establishment of an Islamic republic. Being excluded from the political process, some radical Islamist groups started a campaign of politically motivated violence. In the 1970s this was mainly inter-community violence between Islamists and the Coptic minority. In the 1980s violence increased in intensity in response to Egypt's rapprochement with Israel and the government's pro-Western stance. Attacks were increasingly targeted at the state, taking the form of riots, shoot-outs with the police and assassination attempts on politicians and other public figures (most notably the assassination of President Anwar Sadat in 1981). In the early 1990s the conflict escalated in response to the violent repression of Islamist movements by the government.[22]

International databases on political violence provide only a limited picture of the extent of political conflict intensity in Egypt, because they focus on trans-national terrorism and assassination attempts on important public figures, as reported in the international press.[23] Similarly, the Freedom House and Polity IV databases are able

[20] Fielding and Shortland (2008).
[21] Neumayer (2004).
[22] The history of the conflict is discussed in detail in Abdo (2000) Wickham (2002). For an empirical study of the conflict see Fielding and Shortland (2010).
[23] The International Institute for Counter-Terrorism database lists 22 attacks in Egypt from 1990 to 2000, 15 of which were targeted at the tourism industry. The Terrorism Research Centre lists 24 terrorist incidents directed against tourists and politicians. The US Department of State's publication "Patterns of Global Terrorism" reports 16 attacks against tourists and 6 attacks on political targets in.

to pick up only major changes in the government's respect for civil liberties and the degree of political participation.[24] For this reason we use a detailed and unique database constructed from the news archive of Egypt's largest daily paper *Al Ahram.*[25] This provides details on Islamist violence against state and civilian targets, as well as the activities of the security forces, such as arrests, trials, executions and civilians being killed or wounded during demonstrations and gun-battles. Our dataset is more precise than those based on sources outside Egypt[26] although wee note that Islamist violence and counter-violence may have been subject to selective reporting. The Egyptian media are politically controlled[27] and NGOs are prevented from publishing independent statistics.[28] However, there is no evidence to suggest that there were major changes in editorial policy regarding what proportion and type of incidents are reported in the period under investigation. There is therefore no reason to suppose that there will be any bias in parameter estimates in a pure time-series model. In this paper we focus on the four dimensions of violence discussed below.

Attacks on Tourists

Attacks on tourists are illustrated in Figure 1. Attacks varied in severity, taking the form of sniper shooting at passing cruise ships, passenger trains and tourist buses, the bombing of buses and cafes and the shooting of foreigners at tourist attractions. The main series of 25 attacks against tourists started in August 1992, and attacks occurred every 2-6 months until March 1995. A further series of three attacks occurred between November 1995 and March 1996, and the final two attacks in September and November 1997, the last being shooting of 88 tourists and locals at the temple of Hatshepsout in Luxor. This massacre undermined public support for the Islamists and

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However, Egypt's largest daily newspaper *Al Ahram* provided details of 39 attacks on the tourism industry alone, in 31 of which foreign nationals were wounded or killed.

[24] In 1993 Freedom House revised its evaluation of political rights and civil liberties in Egypt from "Partially Free" to "Not Free"; this rating remained constant for the remainder of our sample period. In the Marshall *et al's* Polity IV database Egypt's score on the Polity variable is -3 from 1990-1998 and then -6 for 1999 and 2000.

[25] The dataset was compiled for ESRC grant (RES-000-22-0312) and is available at http://www.prio.no/jpr/datasets.

[26] Unfortunately it is only available for the 1990s.

[27] The editor of *Al Ahram* is appointed by the President.

[28] The publication *Civil Society* of the Ibn Khaldoun Centre has occasionally published political violence data, but details and updates are not available as the centre was closed and its founder and several of the research staff were arrested in 2000.

resulted in a huge increase in security measures around tourist attractions. There were no further attacks on tourists during the sample period.

Islamist violence directed against Egyptians

Our proxies for the level of community tension are based on the violence perpetrated by Islamist groups against Egyptians, illustrated in Figure 2. Islamist violence has taken a number of different forms, one aspect of which is inter-community violence, that is, assaults on the Coptic Christian minority. Many of these attacks were initially disputes about property or "protection money" but acquired political overtones. A second aspect is the attempt by Islamists to impose *Shari'a* laws in Egypt, attacking individuals and activities considered to be "un-Islamic", such as liquor stores, beer deliveries, video-stores and cinemas showing foreign films, as well as individuals engaged in "vice". There has also been some political violence connected to elections, during which supporters of different candidates have clashed in street fights. Thirdly, there have been assassination attempts on politicians and other public figures, such as poets, authors and academics, who have been singled out for the moral or religious views taken in their writing. Fourthly, security forces have been targeted directly by Islamist groups, or have been killed in gun battles linked to arrests. Figure 2 shows an escalation of political violence in 1992 and 1993, slowly tailing off from 1994 to 1998. In 1999 one of the violent Islamist Organisations *Al Gama'at al Islamiya* initiated a ceasefire, but inter-community violence reignited in 2000.

Counter-violence

The Egyptian security forces' response to Islamist violence reported in the Egyptian media includes arrests, detention (with and without trial) and death sentences for some of those convicted of terrorist offences.[29] The wording of the reports in *Al Ahram* suggests that members of the political opposition are regarded as "terrorist suspects"; or at least, that is how the government wishes the media to portray them.[30] Arrests were sometimes preceded by gun battles in which both suspected Islamists

[29] Human rights organisations such as Amnesty International additionally report widespread human rights violations, such as torture and deaths in custody, e.g. http://www.amnesty.org/en/region/egypt.

[30] E.g. *Al Ahram* reports arrests of "dangerous terrorists" during which security forces found "anti-government leaflets" and "knives", suggesting a rather more peaceful type of opposition.

and innocent bystanders were killed and wounded. Demonstrations have also been subject to heavy-handed policing, often resulting in casualties and large-scale arrests. We are not able to distinguish between different categories of civilians (political dissidents / extremists / bystanders), and so we aggregate all attacks on civilians. The number of civilians reported as being killed, wounded and arrested by the security forces are summarised in Figure 3. From January 1988 to December 2000 a total of 19,915 arrests of suspected Islamists were reported by *Al Ahram*. In the same period 605 civilians were killed and 556 civilians were wounded by the security forces and 114 death sentences were reported to have been carried out.[31]

Conflict in Israel

Violence in Israel and the West Bank and Gaza is illustrated in Figure 4. The data are provided by the Israeli NGO B'Tselem.[32] Fatalities among Israelis in Israel, which are the best proxy for the risk to tourists in Israel, are highest in the period 1994-1996. Fatalities among the Palestinians in the West Bank and Gaza, which might fuel anti-Israeli and anti-Western sentiment in Egypt, were relatively high between 1990 and 1994, relatively low between 1995 and 1999 and rose sharply with the beginning of the second *Intifada* in September 1999.

4: A Model of Tourist Destination Choice

In this section we derive a regression equation for demand for tourism in Egypt. This is based on the standard discrete choice theory in Maddala (1983). The model concerns a population of people who have already decided to take a vacation, and are deciding where to go.[33] Let the net utility an individual i derives from taking a vacation in location $m \in \{1,..., M\}$ in month t be designated v_{imt}. We will assume that each person's utility is of the form:

$$v_{imt} = \mu_{mt}(\mathbf{X_{mt}}, \varepsilon_{mt}) + u_{imt} \qquad (1)$$

[31] In the estimations below we use politically motivated arrests (*cas*) to capture the intensity of Egyptian counter-violence efforts

[32] http://www2.iol.co.il/btselem.

[33] See Enders et al (1992) for an explicit model of a two-stage budgeting decision.

where μ_{mt} is the average level of utility from visiting location m in month t for the vacationing population and u_{imt} is an individual's idiosyncratic deviation from this average. $\boldsymbol{X}_{mt}$ is a vector of identifiable time-varying factors that impact on one's net utility from a vacation in a particular location (including how expensive it is), and ε_{mt} is a stochastic term reflecting the unpredictable component of the average utility level (fads and fashions). We further assume that individual i chooses location m in period t if and only if:

$$v_{imt} = \max (v_{i1t},..., v_{iMt}) \tag{2}$$

It can be shown (Maddala, 1983) that if for any two locations (m,n) the distribution of u_{imt} is independent of that of u_{int}, and if each has a Weibull distribution,[34] then the probability of any one individual choosing location m in period t is:

$$p_{imt} = \exp(\mu_{mt}) \Big/ \sum_{j=1}^{j=M} \exp(\mu_{jt}) \tag{3}$$

So, for a large population, the ratio of the number of people in period t visiting location m (p_{mt}) to the number visiting location n (p_{nt}) can be written as:

$$p_{mt}/p_{nt} = \exp(\mu_{mt})/\exp(\mu_{nt}) \tag{4}$$

and hence:

$$\ln(p_{mt}) - \ln(p_{nt}) = \mu_{mt} (\boldsymbol{X}_{\mathbf{m}t}, \varepsilon_{mt}) - \mu_{nt} (\boldsymbol{X}_{\mathbf{n}t}, \varepsilon_{nt}) \tag{5}$$

Location m here is to be interpreted as Egypt; the identity of the reference location n will be discussed later. If we know the functional forms of μ_{mt} (.) and μ_{nt} (.), then we can fit equation (6) to time-series data. In what follows, we assume that it is possible to find a linear specification such that:

[34] Appendix I discusses the relaxation of this assumption.

$$\ln(p_{mt}) - \ln(p_{nt}) = \boldsymbol{B}' [\boldsymbol{X}_{\boldsymbol{m}t} - \boldsymbol{X}_{\boldsymbol{n}t}] + \varepsilon_t \quad (6)$$

where ε_t is a linear function of ε_{mt} and ε_{nt}.

We will proceed with the assumption that $[\boldsymbol{X}_{mt} - \boldsymbol{X}_{nt}]$ comprises (a) seasonal factors, (b) the relative enjoyability of the two locations and (c) the several dimensions of political violence in Egypt and Israel. Our regressions are based on an equation of the form:

$$\ln(p_{mt}) - \ln(p_{nt}) = \Sigma_s \theta_s . h_{st} + \eta . \mathrm{E}[w_{mt} - w_{nt}] + \boldsymbol{B}_1' \, \mathrm{E}[\boldsymbol{Z}_{mt+1}] + \boldsymbol{B}_2' \, \boldsymbol{Z}_{mt} + \varepsilon_t \quad (7)$$

h_{st} is a dummy for month s. w_{mt} is the enjoyability of location m in period t, to which an expectations operator is attached, because new visitors will only find out whether they like a place when they get there. $\boldsymbol{Z}_{mt}$ is a vector of violence indicators in Egypt, the reference location n being assumed to be completely safe. Tourists are concerned about violence in the current month and also expected violence in the next month, because visits may straddle two months.

One might also wonder whether monthly variations in the relative cost of different locations make a difference to tourist numbers. However, our empirical measures of relative cost never produced robust, interpretable statistically significant coefficients. It seems that, in our sample period at least, monthly variations in cost had no substantial impact on tourism to Egypt.

Application of the model requires us to specify the expectations formation process. We will work with the following assumptions:

$$\mathrm{E}[w_{mt} - w_{nt}] = \alpha(\mathrm{L})[\ln(p_{mt-1}) - \ln(p_{nt-1})] \quad (8)$$

$$\mathrm{E}[\boldsymbol{Z}_{mt}] = \boldsymbol{A}(\mathrm{L})' \, \boldsymbol{Z}_{mt-1} \quad (9)$$

Equation (9) builds some herding behaviour into the model: if a destination has been popular in the past, people are more likely to consider it today. Equation (10) states

that expectations about the current risk of violence are based on the past frequency of violent incidents. Substituting equations (9-10) into equation (8), we will have an Autoregressive Distributed Lag (ARDL) equation of the form:

$$\gamma(L)[\ln(p_{mt}) - \ln(p_{nt})] = \Sigma_s \theta_s . h_{st} + \boldsymbol{\Gamma}(L)' \boldsymbol{Z}_{mt} + \varepsilon_t \qquad (10)$$

The elements of the violence vector $\boldsymbol{Z}$ are as follows.

ln(1 + *tkw*), where *tkw* is the number of tourists killed and wounded in Egypt.

ln(1 + *cas*), where *cas* is the number of arrests by Egyptian security forces.

ln(1 + *csk*), where *csk* is the number of civilians and security forces killed by radicals.

ln(1 + *iki*), where *iki* is the number of Israelis killed in political attacks in Israel.

ln(1 + *kwg*), where *kwg* is the number of deaths in fighting in the West Bank / Gaza.

We expect the coefficients on these variables to be negative (*H1-H4*), and larger in absolute size for European tourists than for American tourists (*H5*).

Logarithmic transformations are used to ensure that the variables are approximately symmetrically distributed. ADF tests for the order of integration of the variables indicate them all to be I(0); further details are available on request.

5. Empirical Modelling and Data

5.1 Data

Our sample period covers the 1990s, starting in March 1991 (to exclude any effects from the first Gulf war) and ending December 2000, the last month for which political violence data are available. Equation (11) is to be fitted to data for tourist arrivals into Egypt from (a) America and (b) Western Europe. In order to estimate the parameters of equation (11), we need to construct a dependent variable in which the number of visitors to Egypt from a certain population (American and European tourists

respectively) is expressed relative to the number of visitors from that population to another location.

We use tourist flows to two comparison countries, which both have consistent datasets of monthly tourist arrivals disaggregated by nationality for the sample period. Firstly we use tourism data from Malta, which can be considered as a "safe" alternative destination in the Eastern Mediterranean. Ideally we would use a larger selection of destinations in the Mediterranean, such as Spain, Greece, Turkey and Cyprus, but it was impossible to obtain monthly data disaggregated by nationality for the required period. Moreover, the recent history of these countries means that they cannot be considered 100% safe.[35]

Malta receives a relatively small number of tourists compared to Egypt (particularly from the United States), introducing the potential for excessive noise in the ratio of tourist arrivals to the two destinations.[36] We therefore also use Thailand as an alternative comparison country. Thailand has the advantage of generating tourist flows comparable to those into Egypt.[37] Thailand offers a similar mixture of beach holidays and cultural attractions to Egypt,[38] but did not experience violent attacks on foreign citizens during the period.[39] For the American (European) tourist sample, p_{mt} is interpreted as the number of American (European) visitors to Egypt in a particular month and p_{nt} is interpreted as the number of American (European) visitors to Malta / Thailand. The Egyptian Ministry of Tourism provides detailed statistics of monthly arrivals of tourists, as well as a breakdown of these tourists into American and European visitors in its annual publication "Tourism in Figures". The data on tourist arrivals into Malta are from Malta's National Statistics Office.[40] Data on tourist arrivals into Thailand were provided by the Thai ministry of tourism.

[35] See Drakos and Kutan (2003) for an overview of terrorist events in Greece and Turkey and Abadie and Gardeazabal (2003) for Spain.

[36] From January 1991 to December 2000 the average number of EU visitors to Malta was 45.6% of average EU tourist arrivals into Egypt. For US tourists Malta was a much less likely holiday destination with visits to Malta being just under 6% of the number of visits to Egypt. Indeed the US Malta series has a number of spikes between January 1991 to September 1992, introducing parameter instability and leptokurtic errors. So we report the regression results for data from 1993 onwards.

[37] In 1995 Thailand recorded an average 23,790 US visitor arrivals per month versus 19,108 in Egypt; in 2000 this had increased to 43,171 in Thailand and 28,392 in Egypt.

[38] See for example http://whc.unesco.org/en/statesparties/th for information about UNESCO world heritage sites in Thailand and further information at http://www.thailandsworld.com/index.cfm?p=728.

[39] Terrorist attacks started in 2004 in Southern Thailand.

[40] http://www.nso.gov.mt/.

The five violence variables are measured using the data collated from *Al Ahram* and from the *B'Tselem* database, which are described in Section 3 above. In all cases the violence statistics are expressed in terms of (the log of) the number of fatalities or arrests per month. All equations also include seasonally varying intercepts to take into account variations in tourist flows according to holiday periods and weather conditions, though these are not reported in the results presented and analysed below.

5.2 Results

Tables 1-4 report parameter estimates for our two samples – American and European tourists – and the two comparison countries – Malta and Thailand. (Descriptive statistics for the variables in Tables 1-4 are presented in Appendix II.) The results change slightly when we switch between Malta and Thailand as the control destination. This may reflect the fact that we are capturing the behaviour of two slightly different vacationing populations: those with a specific preference for the Mediterranean, who are making a decision at the margin between Egypt and places like Malta, and those with no such geographical preference, who are making a decision at the margin between Egypt and places further afield, such as Thailand. We use a lag order of three, selected on the basis of the Akaike Criterion: higher order lags were not statistically significant. Appendix III discusses the stability of the parameters in the four tables.

Lags of the *csk* and *kwg* variables (measuring intercommunity tensions in areas which tourists generally avoid) are never statistically significant in any regression equation. We therefore have no evidence regarding hypothesis 3 for this particular period. The intercommunity violence variables were excluded from the regressions reported in Tables 1-4 below.

The first part of tables 1-4 reports the regressions with the three elements of $\boldsymbol{Z}$ that are ever significant: *tkw* (tourist injuries and fatalities), *cas* (politically motivated arrests by the security forces) and *iki* (Israeli deaths in mainland Israel). The second part of each table reports the parameters of corresponding equations in which the dynamics are further restricted so as to minimize the Akaike Criterion for the regressions. It can be seen that these restrictions make no substantial difference to those coefficients that are statistically significant in the unrestricted model. Test

statistics indicate that the null of zero autocorrelation in the regression residuals (and residual variances) cannot be rejected; neither can one reject the null that the residuals are normally distributed. For the European / Thailand sample, normality of the residual is achieved only when a dummy variable for the major incident at the temple of Hatshepsut in 1997 is included. The inclusion of this dummy significantly reduces the regression coefficient for *tkw*, but the *tkw* and December 1997 coefficients should be read together as an indication of the (nonlinear) impact of increased violence.

From tables 1-4 we therefore find clear evidence for the first hypothesis: tourists react negatively to attacks targeted at the tourism industry resulting in the loss of life or injuries. There is also some evidence that European tourists react particularly strongly to (well publicised) large-scale events. Hypothesis 2 is only confirmed in the European sample: on average, European tourists respond to changes in the level of the state's response to political challenge, while American tourists do not seem to pay any attention to this dimension of the conflict. There is no significant response of American tourist numbers to changes in *cas*, even in the short run. Both European and American tourists react similarly to changes in the number of Israeli victims in Palestinian suicide attacks.

To explore these differences between American and European tourists in a more intuitive way, we do not dwell on the individual regression coefficients, but interpret the regression dynamics by plotting the implicit response of $[\ln(p_{mt}) - \ln(p_{nt})]$ to temporary unit increases in each of the elements of $\boldsymbol{Z}$.[41] The plots, based on the coefficients reported in the restricted regression equations in Figures 5-8. Note that a change in *cas* (and *iki* in the Americans / Thailand regression) has no impact on American tourist numbers, even in the short run, because the respective elements of $\boldsymbol{\Gamma}$ are insignificantly different from zero. A common feature of all these figures is that the effects of a temporary increase in violence are very short-lived: either people have short memories, or they know (at least intuitively) that shocks to a stationary violence series do not persist indefinitely. A year afterwards, tourist numbers have recovered almost to their initial level. However, there is a lag of a few months in the effect of an upsurge in violence: in all but a couple of cases, the effect of an increase in violence on tourism peaks at the third or fourth month after the event. Tourist numbers do not

[41] For these illustrative purposes, we assume that each element of $\boldsymbol{Z}$ is strictly exogenous, and hold the other elements constant in each case. The figures are designed to provide an intuitive picture of the dynamics of the regression equations; they are not impulse response functions in the strict sense.

adjust instantaneously in response to an upsurge in violence: people appear generally not to cancel vacations they have already booked when the violence increases.[42]

Comparing figures 5(a) and 6(a) (the American response to tourists killed and wounded) to the equivalent reaction of European tourists, figures 7(a) and 8(a), we see that European tourists react much more sensitively to violence than American tourists, the maximum contraction being more than twice as deep as for American tourists. However, the time profile of the response is very similar for the two populations. Figures 5(b), 7(b) and 8(b) show responses of a similar magnitude to increases in violent deaths in Israel, but the American tourists are quicker to react than European tourists. In both cases the effects of temporary shocks disappear after a year.

Solving out the dynamics of the regression equations, we can also compute "long-run" elasticities that predict the impact on tourism of a hypothetical permanent change in the level of violence. (Although the historical violence series we are using are stationary, it is always possible that there will be a structural break in one of the series in the future. Indeed, there was such a break in the Israeli fatality data just after the end of our sample, with the onset of the *al Aqsa Intifada*.) In the long run, the elasticity for Americans reacting to a permanent increase in the level of violence against tourists is around -0.6 to -0.9. The effect on European tourist numbers is somewhat larger. For the Europeans / Malta regressions the elasticity is around -1.3. In the Europeans / Thailand regressions the elasticity is lower at around -0.5, but there is an additional and much larger effect from the attack on tourists in Luxor in 1997, which suggests that European might be particularly sensitive to large-scale attacks.

Long run elasticities of tourist numbers to a permanent increase in violence

Long-run elasticities	Americans (Malta)	Americans (Thailand)	Europeans (Malta)	Europeans (Thailand)
1 + *tkw*	-0.882	-0.564	-1.296	-0.489
1 + *iki*	0.354	0.292	0.338	*insignificant*
1 + *cas*	*insignificant*	*insignificant*	-0.125	-0.098

[42] This is consistent with Pizam and Fleischer (2002) reporting that tourists (to Israel in their case) mostly book their holidays within the four months preceding their visit.

Luxor massacre 1997				-4.839

Comparing the long-run *tkw* elasticities for Europeans / Malta and Americans / Malta, and comparing the long-run *tkw* and Luxor massacre elasticities for Europeans / Thailand and Americans / Thailand, we can see that the contraction for European tourists in a the wake of a tourist attack is generally more pronounced than for American tourists, and (as the graphs show) European numbers take slightly longer to recover. Both the graphical analysis and the elasticities provide clear confirmation of Hypothesis 5, which predicted a larger reaction on average among the Europeans the majority of whom travel to Egypt for the year-round sun and sand, and less for its cultural attractions.

Hypothesis 4 is also confirmed in that Americans and Europeans appear to substitute between Egypt and Israel as tourist destinations: there is increasing the demand for Egyptian holidays, if the risk of travelling in Israel increases, as indicated in Figures 5(b), 7(b) and 8(b). The Americans / Malta regressions indicate that a unit increase in ln(1 + *iki*) leads to an immediate 5% increase in American numbers, increasing to around 35% in the long run (marginally significant). The Americans / Thailand regressions indicate a long-run effect of 30% (again marginally significant).[43] European arrivals into Egypt increase by 3 -5 per cent after a small lag. The long run elasticity in the Malta regressions is 0.34, whereas in the Thai regressions it is lower and not statistically significant, suggesting that some caution is appropriate in interpreting this result.

The main difference between American and European tourists is in their reaction to the Egyptian security forces response to political violence. Figure 7(c) and 8(c) show the effect of a unit increase in the arrests variable *cas* on European tourists. Demand for Egyptian holidays contracts by 1-2% with a unit increase in ln(1 + *cas*) soon after the shock and if the crackdown is sustained in the long run, tourist numbers drop by 10-12%.[44] Thus on average, European tourists do respond to changes in the level of the state's response to insurgency, which might be viewed by some as

[43] In the Americans / Thailand unrestricted regression the positive coefficients on contemporaneous ln(1 + *iki*) are not significant and the AIC indicates the omission of contemporaneous ln(1 + *iki*) from the regression.

[44] These long run coefficients are highly significant.

excessive. American tourists seem not to pay any attention to this dimension of the conflict.[45]

The results are mostly robust to the choice of comparison country (i.e. Malta or Thailand) and we are therefore confident that the empirical results generated are not spurious. The main discrepancy between the samples is that the Europeans / Thailand regressions indicate a particularly strong response to a large-scale terrorist attack and a lesser response to incidents which affect only a small number of people, while the Europeans / Malta regressions suggest a strong response to all types of attacks.

6. Interpretation and Conclusion

Our results show that the campaign of radical Islamist organisations succeeded in inflicting heavy losses on the Egyptian tourist industry when their attacks were directly targeted at the tourist industry, confirming Hypothesis 1. Even though the actual danger of being caught up in a violent attack was extremely small even at the height of the conflict, many tourists decided to stay away from Egypt. Direct attacks on tourist installations in which foreign citizens are killed or wounded have an immediate effect on people's destination choices when making bookings[46] and it takes more than a year before tourist numbers fully recover after a successful attack. If tourist flows in the aftermath of an attack are stimulated by aggressive price cuts, the actual cost to the tourist industry is likely to be significantly higher than suggested by the contraction in tourist numbers.[47] In addition there is some evidence that European tourists react disproportionately to attacks in which there are large numbers of foreign victims, as indicated by the large and highly significant coefficient on the Luxor temple incident.

Hypothesis 2 is supported by the evidence as Egypt's human rights record does appear to have featured to some extent in European citizens' holiday destination

[45] If anything a positive coefficient on the long-run elasticity suggests that Americans are reassured by a strong security force response to Islamist violence. However, this result is not statistically significant.

[46] The maximum effect appears to occur at the point corresponding to the average tourist's advance booking between 3 and 4 months ahead of the holiday.

[47] Tourism revenues have been shown to take much longer to recover than the number of tourists (Tohamy and Swinscoe, 2000). Local hotel prices will be endogenous, which is the reason for their exclusion from the regression equations. To the extent that tourist numbers impact on prices, our test equation should be viewed as a reduced-form expression.

choices. If the security forces crack-down is a one-off event, the response is relatively small and short-lived. However, a long-term, heavy-handed security policy appears to discourage significant numbers of Europeans from considering an Egyptian holiday. As European arrivals make up about 60% of total tourism to Egypt (versus 6.5% for the US); the Egyptian government should at least consider this effect when designing its security policy.

We have no evidence for our hypothesis 3. Tourists appear to have cared mainly about their own safety, rather than being influenced by low level political conflict between local groups, where the relevant locations can easily be avoided.[48] While this refutes hypothesis 3 in the sample analysed here, it is possible that this result would be different after September 2001. People have become more concerned about Islamist movements and about local tensions bubbling over into violent attacks on foreign interests and this issue will be investigated in future work.

Conflict in Israel has an ambiguous effect on the Egyptian tourist industry. As outlined in hypothesis 4 tourists seem to substitute holidays in Egypt for holidays in Israel when violence increases in Israel. This is probably due to the high degree of substitutability between different Red Sea beach resorts. However, political violence in Israel does occasionally spill over into Egypt, such as the attacks on tourists and hotels in the Sinai.[49] This has unambiguously negative consequences for the Egyptian tourism industry, underlining the importance of the Egyptian government's involvement in the Middle East peace process.

Finally, hypothesis 5 is confirmed by the interesting differences between US and European tourists. European tourists are more sensitive to political violence in Egypt than their American counterparts. This may be because a large number of Europeans go to Egypt on beach holidays, for which there are many (safe) alternative destinations. European tourists therefore react very strongly to violence against the tourism industry. For US tourists the emphasis is more likely to be on Egypt's archaeological attractions, for which there are no close substitutes. Europeans also respond negatively to scaled up counter-violence operations (which in Egypt often ignore human rights), whereas US tourists do not. One possible explanation is that human rights issues are less well publicised in the US media than in Europe, whereas

[48] That is local, intercommunity violence in Egypt and fighting in the West Bank and Gaza.
[49] Fielding and Shortland (2010).

attacks on foreigners do make international headlines and influence (in-) official travel advice. Another possible explanation is that the average American tourist may be more relaxed about the presence of armed guards around tourist venues or even reassured by a strong state response to terrorist threats.

Given these results there are strong policy implications regarding the importance of not letting a political conflict escalate to the point where radical splinter groups attack foreign nationals to publicise their cause. However, a heavy-handed state policy against the Islamist opposition can also have negative effects on tourism. There is some evidence for such an effect with respect to European tourists, who provide the majority of tourism receipts in Egypt. The results might also motivate a policy of subsidising the tourism sector in response to attacks on tourists until tourism levels recover a year later. Finally, efforts to revise the image of Egypt through advertising campaigns in the aftermath of attacks should be primarily directed at the European tourist market, which reacts very sensitively to violence and provides the majority of tourism revenues for Egypt.

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Table 1: $\ln(p_m/p_n)_t$ *regression, American sample, Malta as comparison*

Sample period: 1993m1 – 2000m12*

	unrestricted				***restricted***			
	coeff.	***h.c.s.e.***	***t ratio***	***ptl. R^2***	***coeff.***	***h.c.s.e.***	***t ratio***	***ptl. R^2***
$\ln(p_m/p_n)_{-1}$	0.3468	0.0995	3.48	0.1497	0.4505	0.1023	4.40	0.1970
$\ln(p_m/p_n)_{-2}$	0.3116	0.1013	3.08	0.1206	0.3689	0.0875	4.22	0.1836
$\ln(p_m/p_n)_{-3}$	0.1359	0.0903	1.50	0.0318				
$\ln(1 + cas)$	-0.0016	0.0104	-0.16	0.0004				
$\ln(1 + cas)_{-1}$	0.0128	0.0110	1.17	0.0195				
$\ln(1 + cas)_{-2}$	0.0048	0.0124	0.39	0.0022				
$\ln(1 + cas)_{-3}$	0.0073	0.0096	0.76	0.0083				
$\ln(1 + tkw)$	-0.0268	0.0226	-1.19	0.0200				
$\ln(1 + tkw)_{-1}$	-0.0508	0.0183	-2.77	0.1002	-0.0327	0.0149	-2.19	0.0575
$\ln(1 + tkw)_{-2}$	-0.0672	0.0188	-3.58	0.1567	-0.0444	0.0153	-2.90	0.0961
$\ln(1 + tkw)_{-3}$	-0.0367	0.0188	-1.95	0.0522				
$\ln(1 + iki)$	0.0323	0.0214	1.51	0.0319	0.0403	0.0165	2.44	0.0699
$\ln(1 + iki)_{-1}$	0.0181	0.0171	1.06	0.0160				
$\ln(1 + iki)_{-2}$	0.0047	0.0232	0.20	0.0006				
$\ln(1 + iki)_{-3}$	0.0176	0.0208	0.85	0.0103				
σ	0.1517				0.1495			
R^2	0.8326				0.8140			
adjusted R^2	0.3880				0.3200			
log likelihood	60.660				55.607			
AIC	-3.5391				-3.6422			
SC	-2.8179				-3.1881			
normality test	$\chi(2) = 1.8956$ [0.3876]				$\chi(2) = 3.5604$ [0.1686]			
heterosk. test	F(41,27) = 0.3779 [0.9976]				F(21,57) = 0.7958 [0.7127]			
RESET test	F(1,68) = 2.3524 [0.1297]				F(1,78) = 2.1959 [0.1424]			
AR(1) test	F(1,68) = 1.2381 [0.2697]				F(1,78) = 2.7908 [0.0988]			
ARCH(1) test	F(1,67) = 0.0149 [0.9033]				F(1,77) = 0.0132 [0.9088]			

∗ All standard errors corrected for heteroskedasticity, seasonal intercepts included

Table 2: $\ln(p_m/p_n)_t$ *regression, American sample, Thailand as comparison*

Sample period: 1991m4 – 2000m12*

	unrestricted				***restricted***			
	coeff.	***h.c.s.e.***	***t ratio***	***ptl. R^2***	***coeff.***	***h.c.s.e.***	***t ratio***	***ptl. R^2***
$\ln(p_m/p_n)_{-1}$	0.3652	0.0985	3.71	0.1325	0.3983	0.0837	4.76	0.1833
$\ln(p_m/p_n)_{-2}$	0.3687	0.1086	3.39	0.1135	0.3712	0.0838	4.43	0.1628
$\ln(p_m/p_n)_{-3}$	0.0303	0.0935	0.32	0.0012				
$\ln(1 + cas)$	0.0036	0.0091	0.40	0.0017				
$\ln(1 + cas)_{-1}$	0.0010	0.0105	0.10	0.0001				
$\ln(1 + cas)_{-2}$	-0.0005	0.0110	-0.04	0.0000				
$\ln(1 + cas)_{-3}$	0.0038	0.0086	0.45	0.0022				
$\ln(1 + tkw)$	-0.0204	0.0146	-1.40	0.0214				
$\ln(1 + tkw)_{-1}$	-0.0198	0.0164	-1.21	0.0159				
$\ln(1 + tkw)_{-2}$	-0.0515	0.0134	-3.85	0.1414	-0.0384	0.0125	-3.06	0.085
$\ln(1 + tkw)_{-3}$	-0.0413	0.0136	-3.04	0.0930	-0.0320	0.0139	-2.30	0.0498
$\ln(1 + iki)$	0.0198	0.0158	1.25	0.0172				
$\ln(1 + iki)_{-1}$	0.0161	0.0216	0.75	0.0061				
$\ln(1 + iki)_{-2}$	0.0139	0.0139	1.01	0.0111				
$\ln(1 + iki)_{-3}$	0.0191	0.0156	1.22	0.0163				
σ	0.1316				0.1288			
R^2	0.7591				0.7411			
adjusted R^2	0.3739				0.3270			
log likelihood	86.580				82.356			
AIC	-3.8563				-3.9722			
SC	-3.2189				-3.5944			
normality test	$\chi(2) = 0.7525$ [0.6864]				$\chi(2) = 2.6919$ [0.2603]			
heterosk. test	F(41,48) = 0.3697 [0.9993]				F(19,81) = 0.6886 [0.8196]			
RESET test	F(1,89) = 0.3755 [0.5416]				F(1,100) = 0.8920 [0.3472]			
AR(1) test	F(1,89) = 1.2333 [0.2698]				F(1,100) = 0.1390 [0.7100]			
ARCH(1) test	F(1,88) = 0.1093 [0.7418]				F(1,99) = 0.9337 [0.3363]			

∗ All standard errors corrected for heteroskedasticity, seasonal intercepts included

Table 3: $\ln(p_m/p_n)_t$ *regression, European sample, Malta as comparison*

Sample period: 1991m4 – 2000m12*

	unrestricted				***restricted***			
	coeff.	***h.c.s.e.***	***t ratio***	***ptl. R^2***	***coeff.***	***h.c.s.e.***	***t ratio***	***ptl. R^2***
$\ln(p_m/p_n)_{-1}$	0.5446	0.1118	4.87	0.2086	0.5377	0.0699	7.69	0.3789
$\ln(p_m/p_n)_{-2}$	-0.0154	0.0894	-0.17	0.0003				
$\ln(p_m/p_n)_{-3}$	0.2727	0.0521	5.24	0.2337	0.2661	0.0633	4.20	0.1540
$\ln(1 + cas)$	-0.0214	0.0112	-1.91	0.0390	-0.0246	0.0100	-2.46	0.0588
$\ln(1 + cas)_{-1}$	0.00444	0.0122	0.36	0.0015				
$\ln(1 + cas)_{-2}$	0.0002	0.0099	0.02	0.0000				
$\ln(1 + cas)_{-3}$	-0.0076	0.0102	-0.75	0.0062				
$\ln(1 + tkw)$	-0.0085	0.0176	-0.484	0.0026				
$\ln(1 + tkw)_{-1}$	-0.0902	0.0282	-3.20	0.1023	-0.0876	0.0266	-3.29	0.1005
$\ln(1 + tkw)_{-2}$	-0.0548	0.0241	-2.28	0.0545	-0.0548	0.0213	-2.57	0.0638
$\ln(1 + tkw)_{-3}$	-0.1100	0.0243	-4.53	0.1856	-0.1119	0.0211	-5.30	0.2244
$\ln(1 + iki)$	0.0332	0.0123	2.71	0.0753	0.0290	0.0135	2.14	0.0451
$\ln(1 + iki)_{-1}$	-0.0247	0.0179	-1.38	0.0207				
$\ln(1 + iki)_{-2}$	0.0428	0.0180	2.38	0.0591	0.0374	0.0168	2.23	0.0488
$\ln(1 + iki)_{-3}$	0.0113	0.0210	0.54	0.0032				
σ	0.1463				0.1432			
R^2	0.9584				0.9571			
adjusted R^2	0.4865				0.4700			
log likelihood	74.199				72.3577			
AIC	-3.6447				-3.7329			
SC	-3.0073				-3.2607			
normality test	$\chi(2) = 1.5734$ [0.4553]				$\chi(2) = 1.0942$ [0.5786]			
heterosk. test	F(41,48) = 1.3827 [0.1397]				F(27,69) = 2.1535 [0.0056]			
RESET test	F(1,89) = 0.3223 [0.5717]				F(1,96) = 0.2082 [0.6492]			
AR(1) test	F(1,89) = 0.2789 [0.5987]				F(1,96) = 0.2531 [0.6161]			
ARCH(1) test	F(1,88) = 0.1414 [0.7078]				F(1,95) = 0.0008 [0.9780]			

∗ All standard errors corrected for heteroskedasticity, seasonal intercepts included

Table 4: $\ln(p_m/p_n)_t$ *regression, European sample, Thailand as comparison*

Sample period: 1991m4 – 2000m12*

	unrestricted				***restricted***			
	coeff.	***h.c.s.e.***	***t ratio***	***ptl. R^2***	***coeff.***	***h.c.s.e.***	***t ratio***	***ptl. R^2***
$\ln(p_m/p_n)_{-1}$	0.3157	0.0997	3.17	0.1045	0.3616	0.1040	3.48	0.1162
$\ln(p_m/p_n)_{-2}$	0.1935	0.0842	2.30	0.0580	0.1739	0.0741	2.35	0.0565
$\ln(p_m/p_n)_{-3}$	0.1834	0.0608	3.02	0.0956	0.1803	0.0690	2.61	0.0691
$\ln(1 + cas)$	-0.0040	0.0081	-0.49	0.0028				
$\ln(1 + cas)_{-1}$	-0.0109	0.0069	-1.59	0.0285				
$\ln(1 + cas)_{-2}$	-0.0022	0.0085	-0.25	0.0007				
$\ln(1 + cas)_{-3}$	-0.0130	0.0076	-1.71	0.0329	-0.0159	0.0071	-2.24	0.0516
$\ln(1 + tkw)$	-0.0277	0.0128	-2.16	0.0514	-0.0346	0.0105	-3.30	0.1060
$\ln(1 + tkw)_{-1}$	-0.0280	0.0196	-1.43	0.0232	-0.0396	0.0224	-1.77	0.0329
$\ln(1 + tkw)_{-2}$	-0.0461	0.0146	-3.15	0.1032	-0.0546	0.0141	-3.88	0.1407
$\ln(1 + tkw)_{-3}$	-0.0513	0.0170	-3.01	0.0954	-0.0566	0.0168	-3.37	0.1099
$\ln(1 + iki)$	-0.0013	0.0125	-0.10	0.0001				
$\ln(1 + iki)_{-1}$	-0.0173	0.0152	-1.13	0.0147				
$\ln(1 + iki)_{-2}$	0.0308	0.0159	1.94	0.0421	0.0306	0.0163	1.88	0.0370
$\ln(1 + iki)_{-3}$	0.0102	0.0144	0.71	0.0058				
D97m12	-0.6869	0.1104	-6.22	0.3106	-0.5922	0.0995	-5.95	0.2779
$D97m12_{-1}$	-0.4373	0.0960	-4.56	0.1944	-0.3696	0.0881	-4.20	0.1606
$D97m12_{-2}$	-0.1476	0.0833	-1.77	0.0353	-0.0944	0.0754	-1.25	0.0168
$D97m12_{-3}$	-0.2152	0.0581	-3.70	0.1375	-0.1625	0.0496	-3.27	0.1044
σ	0.1076				0.1071			
R^2	0.9557				0.9531			
adjusted R^2	0.5883				0.5638			
log likelihood	112.86				109.47			
AIC	-4.2371				-4.2818			
SC	-3.5053				-3.6916			
normality test	$\chi(2) = 0.8298$ [0.6604]				$\chi(2) = 0.4440$ [0.8009]			
heterosk. test	F(45,40) = 0.5385 [0.9775]				F(33,58) = 0.8698 [0.6622]			
RESET test	F(1,85) = 0.8159 [0.3689]				F(1,91) = 0.6424 [0.4249]			
AR(1) test	F(1,85) = 1.2652 [0.2638]				F(1,91) = 2.6835 [0.1048]			
ARCH(1) test	F(1,84) = 0.0147 [0.9037]				F(1,90) = 0.6441 [0.4244]			

∗ All standard errors corrected for heteroskedasticity, seasonal intercepts included

Figure 1: Attacks on Tourists

□ *tourists killed* ■ *tourists wounded*

■ *tourists attacked without injury*

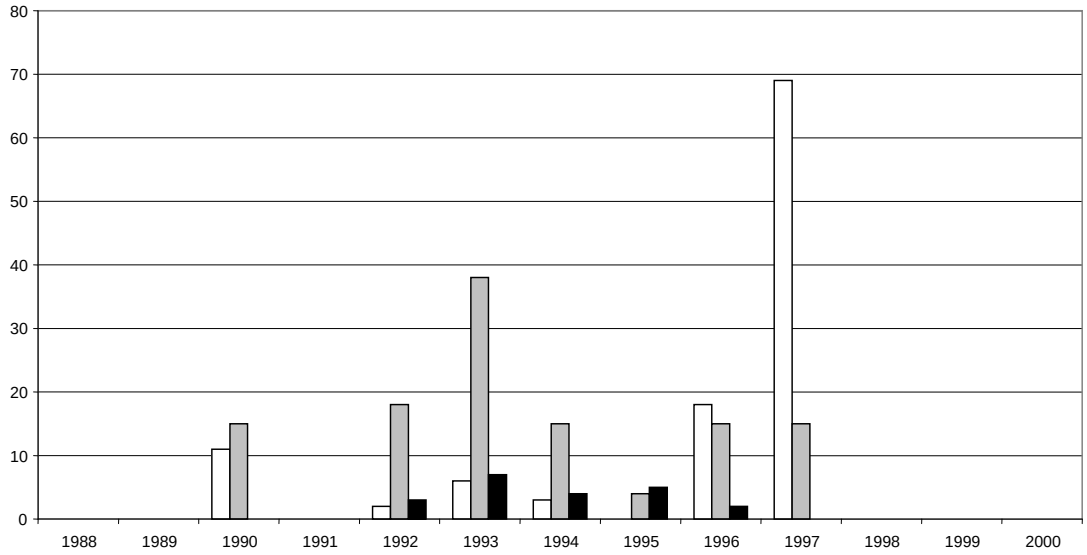


Figure 2: Islamist Violence against Egyptians

□ *civilians wounded by civilians* ■ *security forces wounded*

■ *civilians killed by civilians* ■ *security forces killed*

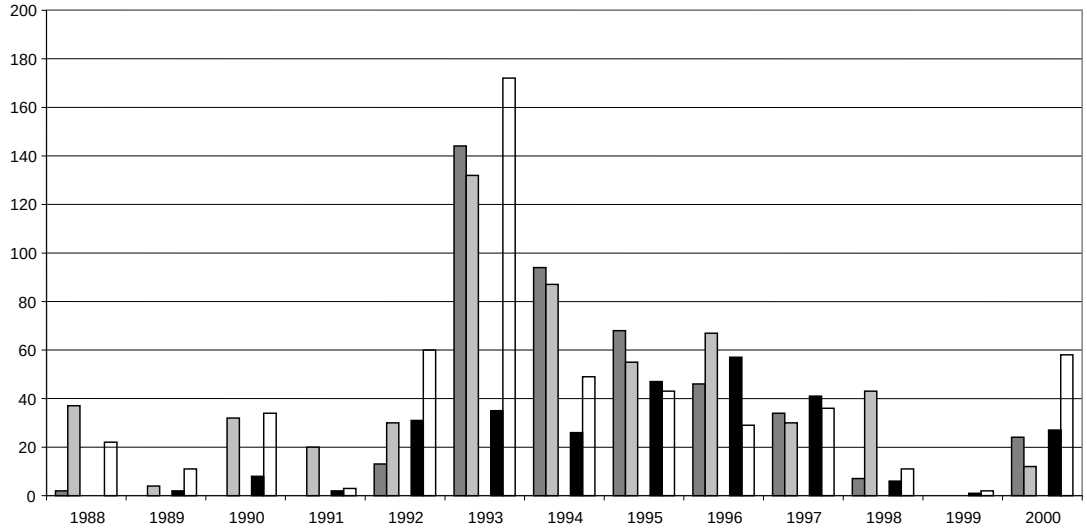


Figure 3: Security Force Actions

□ *civilians wounded by security forces* ■ *arrests (x 0.1)*

■ *civilians killed by security forces*

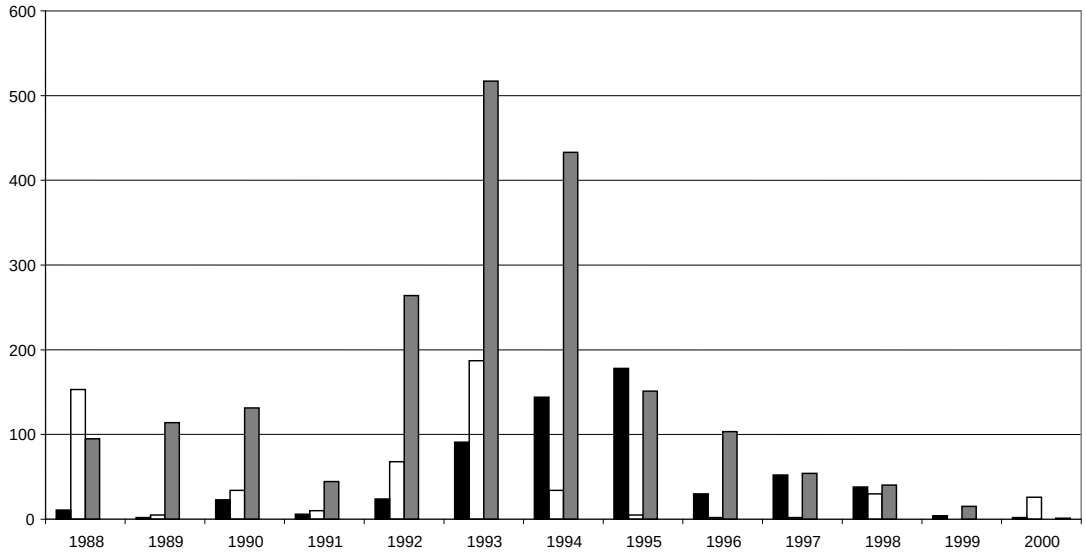


Figure 4: The Israel / Palestine Conflict

□ *Palestinians killed in WBG* ■ *Israelis killed in WBG*

■ *Palestinians killed in Israel* ■ *Israelis killed in Israel*

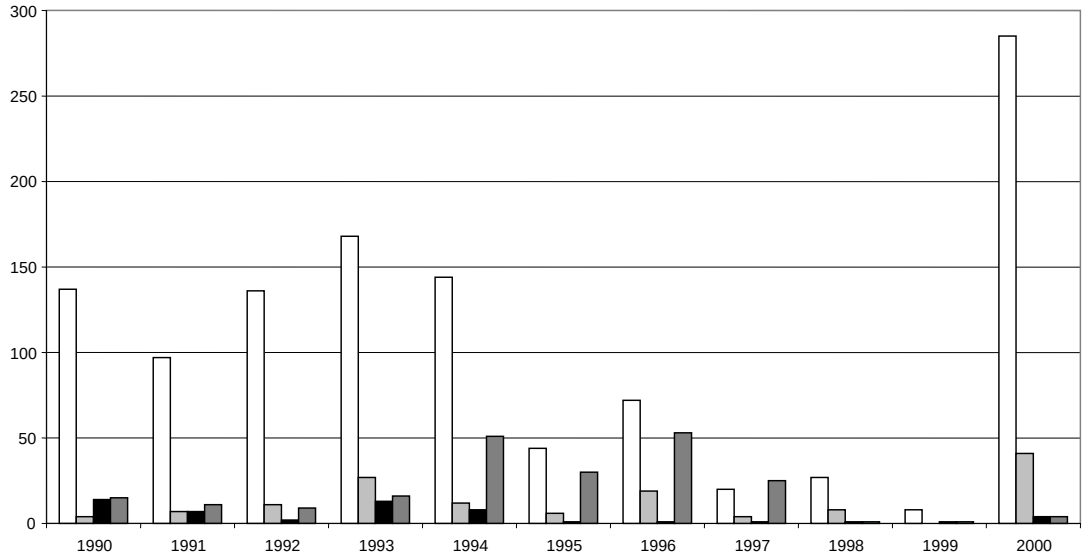
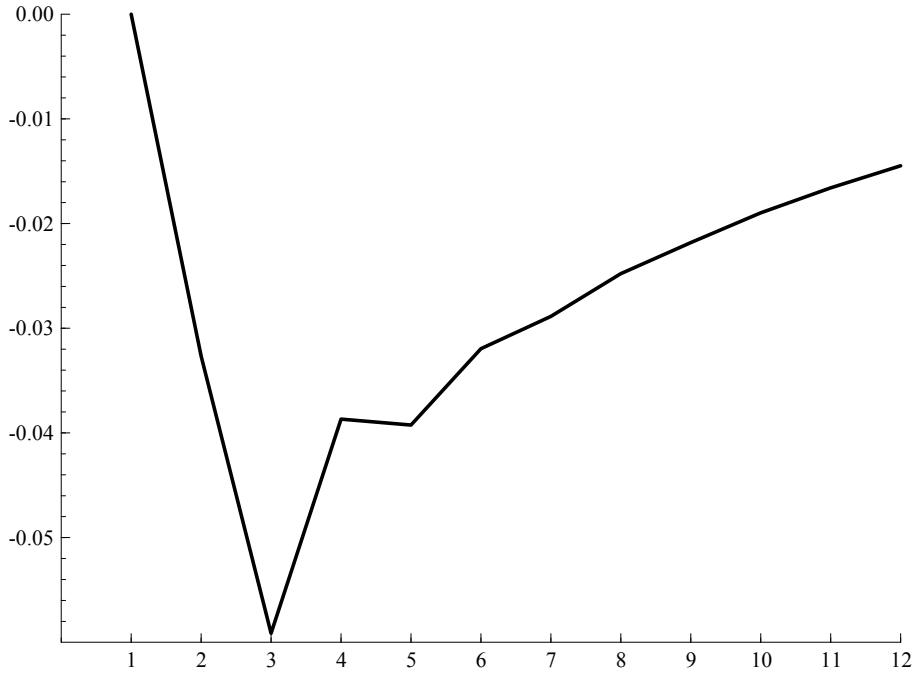
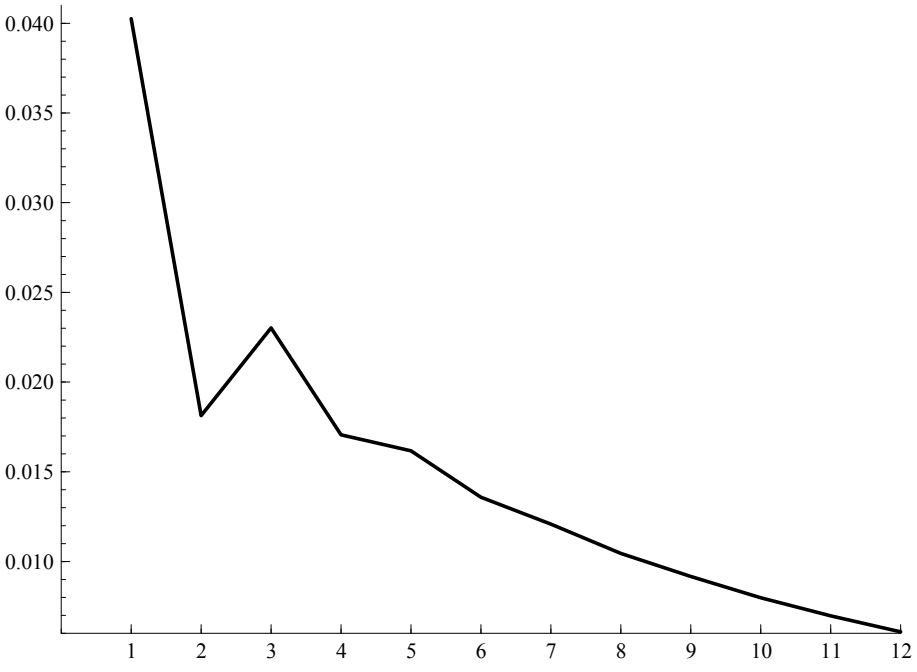


Figure 5: Impulse Responses for Americans / Malta

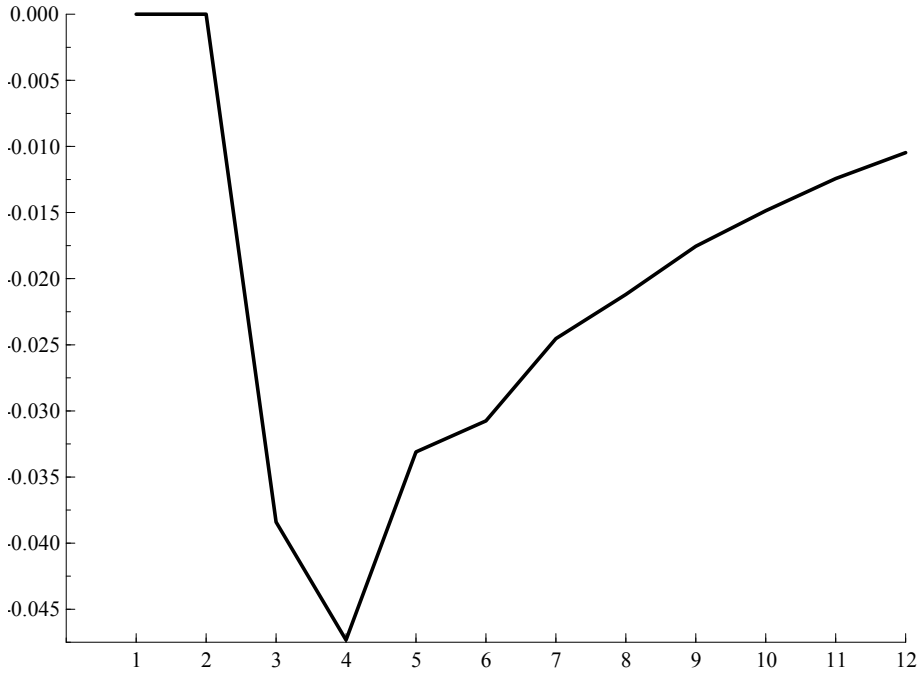


(a) Response of American tourist arrivals to a temporary unit increase in the number of tourists attacked in Egypt (ln(1 + *tkw*)), first 12 months



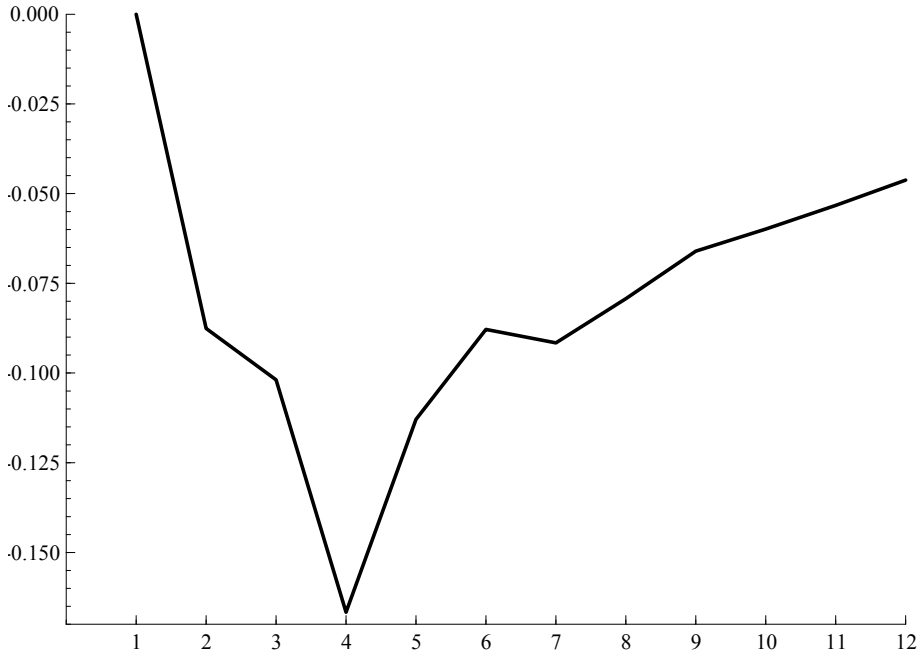
(b) Response of American tourist arrivals to a temporary unit increase in the number of violent deaths in Israel (ln(1 + *iki*)), first 12 months

Figure 6: Impulse Responses for Americans / Thailand

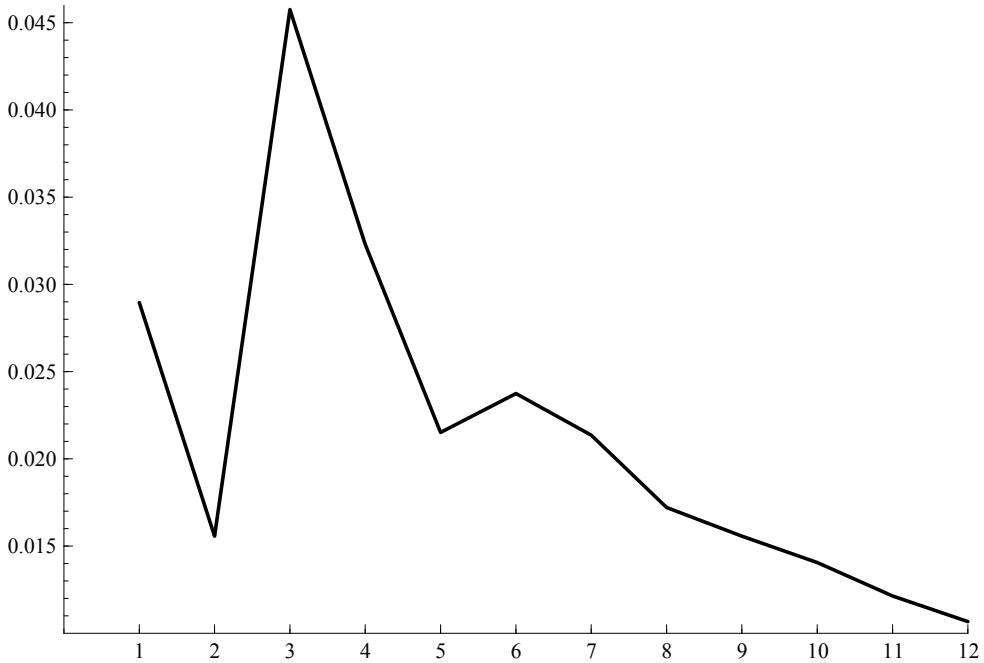


(a) Response of American tourist arrivals to a temporary unit increase in the number of tourists attacked in Egypt (ln(1 + *tkw*)), first 12 months

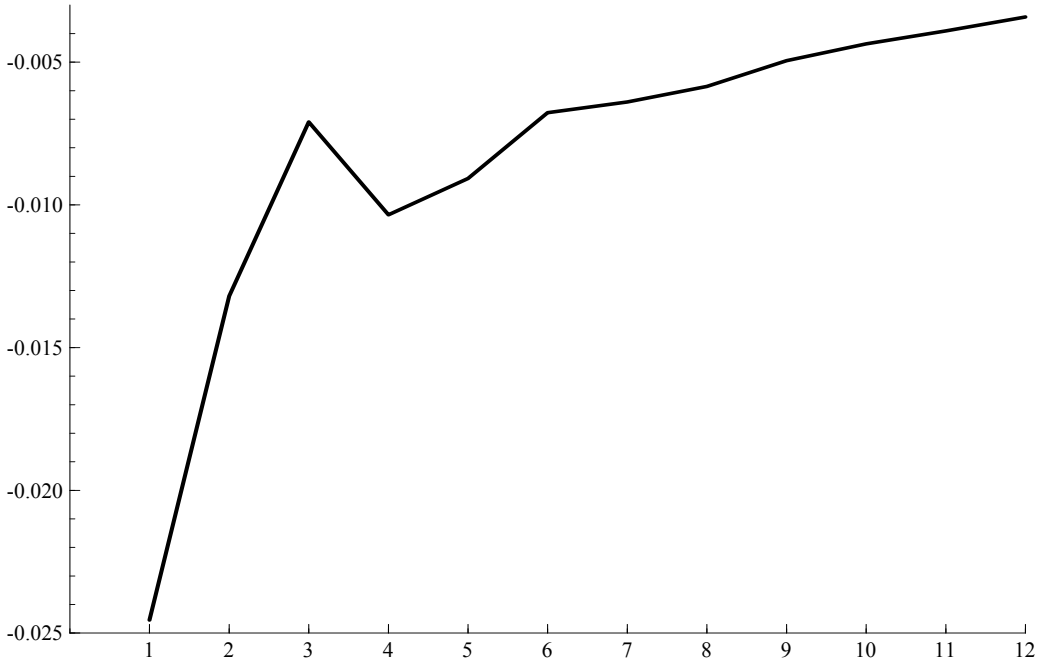
Figure 7: Impulse Responses for Europeans / Malta



a) Response of European tourist arrivals to a temporary unit increase in the number of tourists attacked in Egypt (ln(1 + *tkw*)), first 12 months

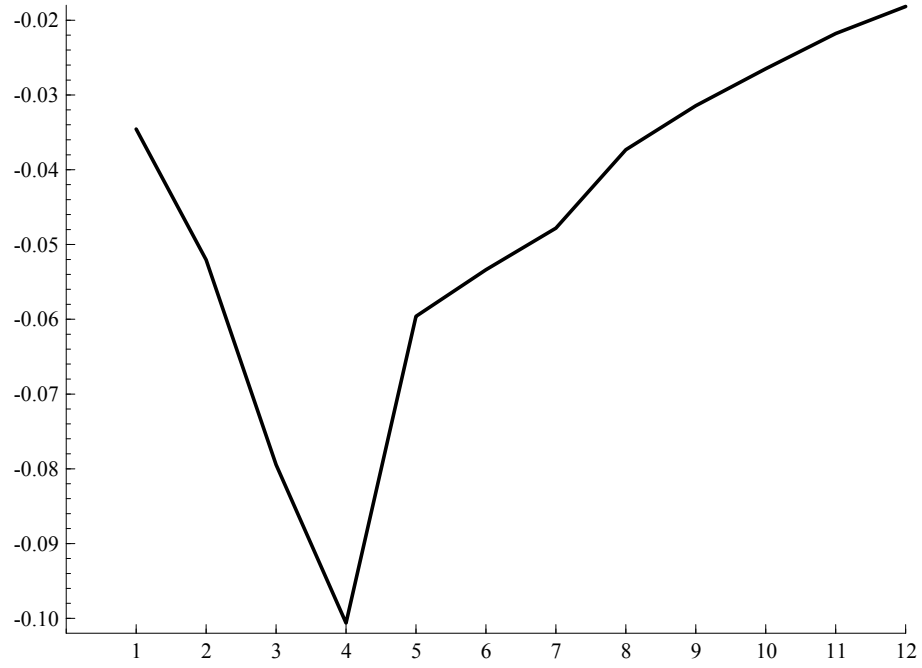


b) Response of European tourist arrivals to a temporary unit increase in the number of violent deaths in Israel (ln(1 + *iki*)), first 12 months

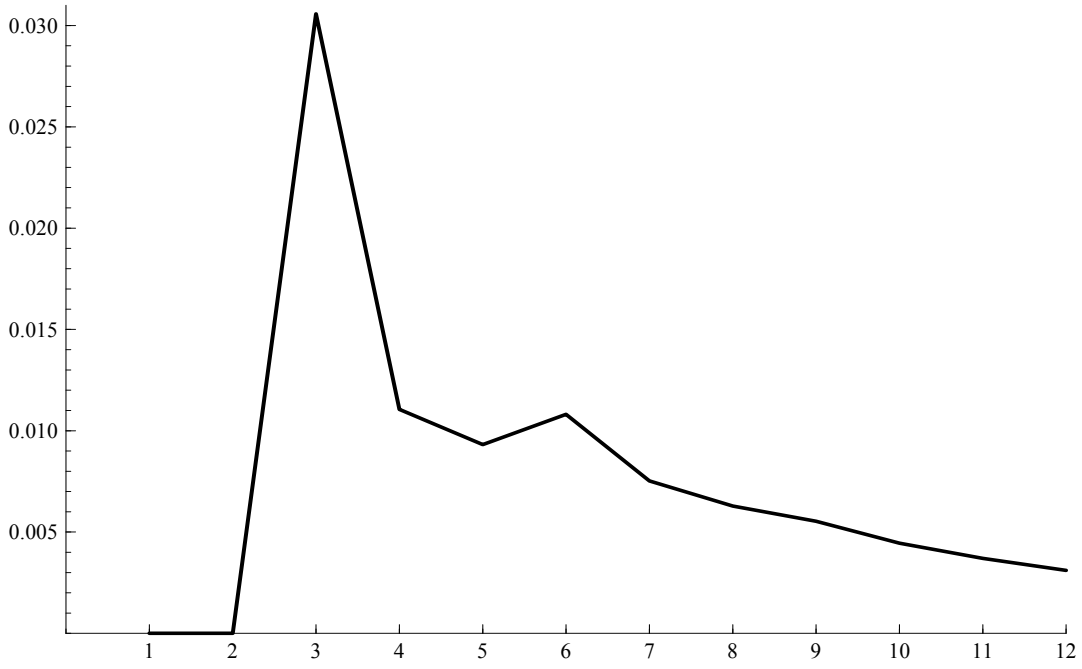


c) Response of European tourist arrivals to a temporary unit increase in the number of suspected Islamists arrested (ln(1 + *cas*)), first 12 months

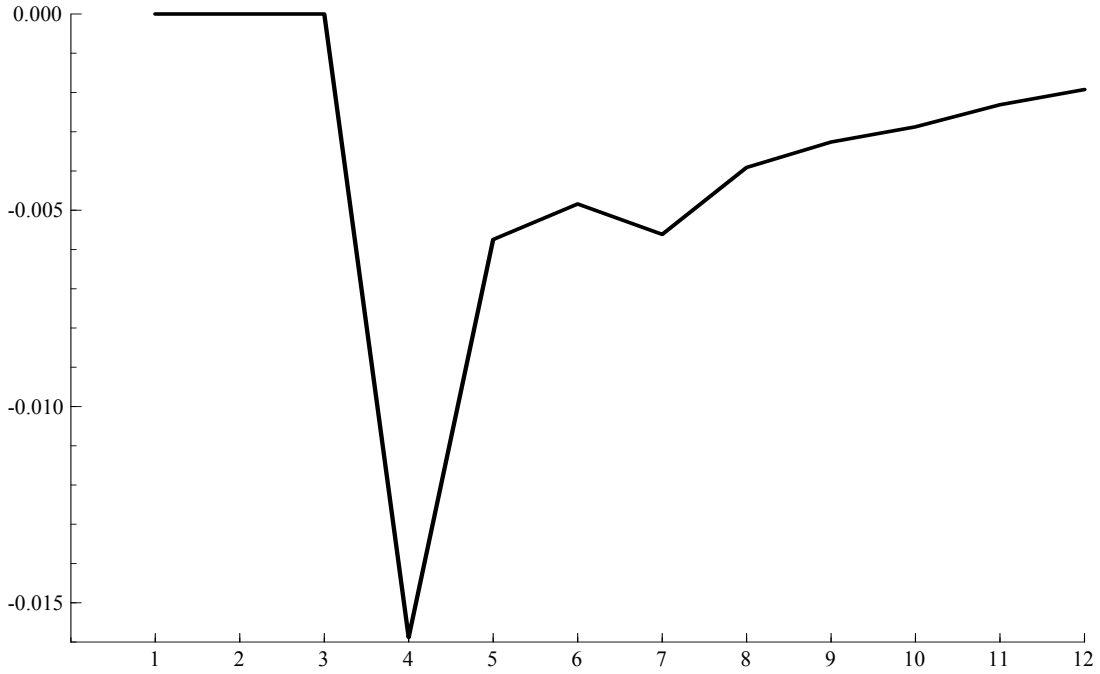
Figure 8: Impulse Responses for Europeans / Thailand



a) Response of European tourist arrivals to a temporary unit increase in the number of tourists attacked in Egypt (ln(1 + *tkw*)), first 12 months



b) Response of European tourist arrivals to a temporary unit increase in the number of violent deaths in Israel (ln(1 + *iki*)), first 12 months



c) Response of European tourist arrivals to a temporary unit increase in the number of suspected Islamists arrested (ln(1 + *cas*)), first 12 months

Appendix I : Testing the Validity of some of the Assumptions Embodied in the Regression Equations

The most substantial restriction embodied in model presented in the main text is that the distribution of individual idiosyncratic preferences for each location (u_{imt}) is independent of the others. In other words, the idiosyncratic component of the utility that individual i derives from location m (relative to some numeraire location) is uncorrelated with the idiosyncratic component of the utility that the individual derives from location n. This assumption can be relaxed. Following Maddala (1983), we can consider a multivariate generalisation of the Weibull Distribution. Suppose for example that there are four locations, and that

$$\mathrm{F}(u_{i1t}, u_{i2t}, u_{i3t}, u_{i4t}) = \exp(-G) \tag{A1}$$

where

$$G = \exp\left(-u_{i1t}\right) + \left\{\sum_{m=2}^{m=4}\left[\exp\left(-u_{imt}\right)\right]^{\frac{1}{1-\gamma}}\right\}^{1-\gamma}, \quad 0 \le \gamma \le 1 \tag{i}$$

or

$$G = \left\{\sum_{m=1}^{m=2}\left[\exp\left(-u_{imt}\right)\right]^{\frac{1}{1-\gamma}}\right\}^{1-\gamma} + \left\{\sum_{m=3}^{m=4}\left[\exp\left(-u_{imt}\right)\right]^{\frac{1}{1-\delta}}\right\}^{1-\delta}, \quad 0 \le \gamma \le 0, \quad 0 \le \delta \le 0 \tag{ii}$$

In this Generalised Extreme Value Distribution (GEV), the parameters γ and δ and capture the degree of likeness among the members of a group of similar locations. When $\gamma \to 1$ or $\delta \to 1$, then there is a group of locations which are virtually identical (in respect of those characteristics which drive the idiosyncratic component of individual utility levels). When $\gamma = \delta = 0$, then $G(\cdot)$ is linear in the $\exp(-u_{imt})$ and the model collapses to the linear form given in equation (3). The two non-degenerate forms of $G(\cdot)$ correspond to two possible patterns of location grouping: either a singleton and a triplet (i) or two pairs (ii).

Within each group, the ratios of the number of people visiting each location will still be linear in the μ_{mt}. In case (i) for example, if we normalise on μ_{4t}, the shares for choices 2–4 are characterised by the linear equation:

$$\ln(p_{mt}) - \ln(p_{4t}) = \mu_{mt} / [1 - \gamma], \; m = 2,3 \tag{A2}$$

By contrast, the equation for the singleton's share will be non-linear, with

$$\ln(p_{1t}) - \ln(p_{4t}) = \mu_{1t} + \gamma \cdot \ln(1 - p_{1t}) - \ln(p_{4t}) \qquad \text{(A3)}$$

The validity of the model in the text therefore depends on either the universal independence of the u_{imt} distributions, or else that Egypt, Malta and Thailand belong to the same group within a GEV framework. This is a *necessary* condition for the validity of the log-linear functional form in equation (5) of the text, and in Tables 1-4. (The jointly *sufficient* conditions are independence plus the linearity of the $\mu_{mt}(\cdot)$ functions.) If the countries belong to different groups, or if some distribution more complex than GEV applies, then a linear model will no longer be valid. In the text, we assume that the u_{imt} are independent of each other and the $\mu_{mt}(\cdot)$ functions are linear. This null hypothesis can be tested by applying a RESET test (Ramsey, 1969) to the models in Tables 1-4. If our models pass a RESET test, then we cannot reject the null.

Table A1 reports the results of RESET tests applied to all of the models in Tables 1-4. For each model, we report the p-value corresponding to the null that the regression equations are indeed linear. It can be seen that none of the test statistics is significant, even at the 10% level. We conclude that the assumptions embodied in the main text are reasonable.

References

Maddala, G. (1983) *Limited Dependent and Qualitative Variables in Econometrics*, Cambridge University Press: Cambridge, England.

Ramsey, J.B. (1969) "Tests for Specification Errors in Classical Linear Least Squares Regression Analysis", *Journal of the Royal Statistical Society (B)*, 31(2): 350-371.

Table A1: P-values of RESET Tests for the Models in Table 1 – Table 4

	American sample		European sample	
	Malta as a comparison	Thailand as a comparison	Malta as a comparison	Thailand as a comparison
Unrestricted model	0.130	0.542	0.572	0.369
Restricted model	0.142	0.347	0.649	0.425

Appendix II: Descriptive Statistics for the Variables of Interest

Sample period: 1991m1 – 2000m12

alternative measures of $ln(p_m/p_n)$

	American sample		European sample	
	Malta as a comparison	Thailand as a comparison	Malta as a comparison	Thailand as a comparison
mean	-4.043	-7.349	-4.365	-6.807
s.d.	0.351	0.278	0.665	0.528

violence variables

	ln (1 + *cas*)	ln (1 + *tkw*)	ln (1 + *iki*)
mean	3.669	0.295	0.511
s.d.	1.885	0.795	0.782

Appendix III : The Stability of the Parameters in the Regression Equations

Table A3 presents the results of Chow Test statistics for parameter stability in each of the regression equations in Tables 1-4 of the main text. These are based on a comparison of the parameter estimates in the tables with estimates based on a restricted sample excluding the last 12 months of the sample (that is, the observations for the year 2000). It can be seen that there is no evidence for any parameter instability, except in the case of the Europeans / Malta regressions. Figures A1-A2 provide further information about this case, focussing on the restricted regression on the right hand side of Table 3. Figures A1 shows one-step forecast errors for the Europeans / Malta series for each month of 2000, that is, forecasts for month *t* based on a regression fitted to a sample ending in month *t*-1. Figure A2 shows corresponding recursive parameter estimates, showing how the different parameter estimates change as the sample is lengthened. It can be seen that the Chow Test failure is due to very large forecast errors in two months (May and September); otherwise, forecast errors are relatively small, and there is no significant change in the estimate of any individual slope coefficient. In other words, the year 2000 did not fit the normal seasonal pattern, but the parameters of interest appear still to be stable.

Table A3: P-values of Chow Tests for the Models in Table 1 – Table 4

	American sample		European sample	
	Malta as a comparison	Thailand as a comparison	Malta as a comparison	Thailand as a comparison
Unrestricted model	0.441	0.397	0.011	0.966
Restricted model	0.380	0.496	0.011	0.969

Figure A1: One-Step Forecast Errors in the Europeans / Malta Regression with ± 2 s.e. Bars

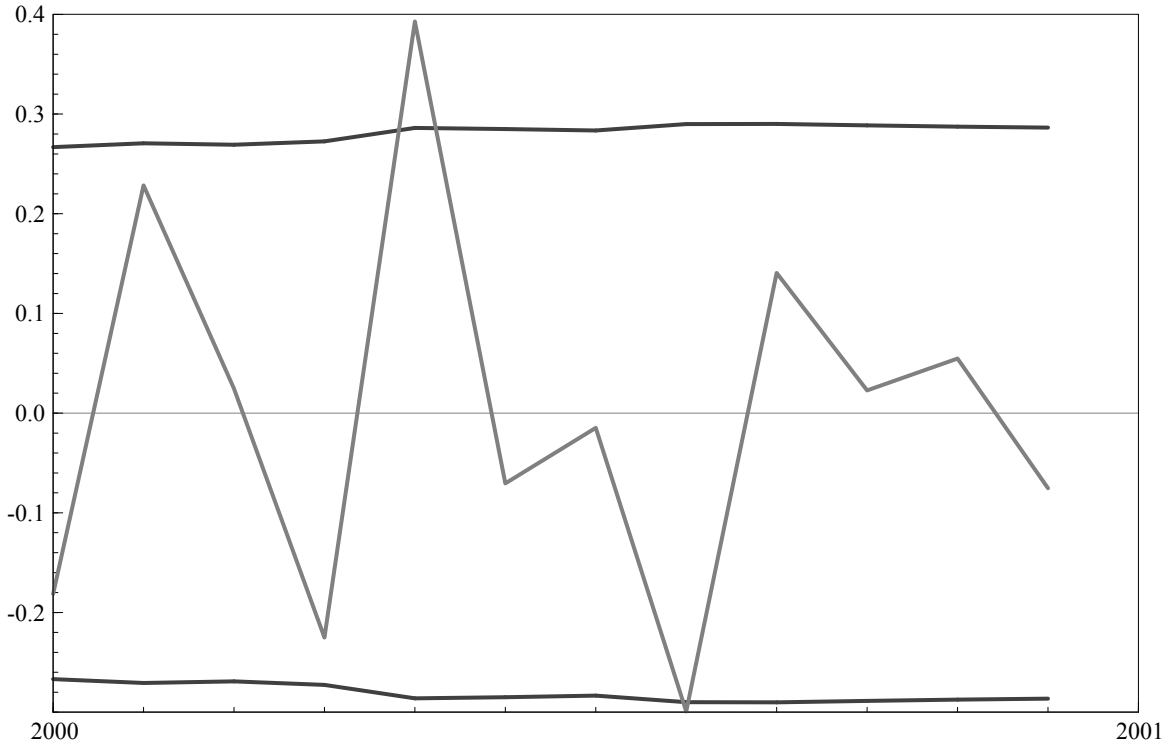


Figure A2: Recursive Parameter Estimates in the Europeans / Malta Regression with ± 2 s.e. Bars